Modeling Medical Professional Liability Damage Caps

An Illinois Case Study

Prepared for: Casualty Loss Reserve Seminar
Lake Buena Vista, FL

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Overview of Presentation

- Background
- Scope of Analysis
- Overview of Model
- Derivation of Model Assumptions
- Summary of Results
- Other Considerations

Topic #1: Background

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Background
Illinois Medical Professional Liability Statutes

- Tort reform enacted in 2005 (Public Act 94-677, aka Reform Act)
- Five reform provisions:
  - Limit on non-economic damages
    - Hospitals - $1,000,000 limit
    - Physicians - $500,000 limit
  - Periodic payment provisions
  - Revised standards for expert witnesses
  - Public identification of physician signing “affidavit of merit”
  - Encouragement for health care professionals to acknowledge medical errors

Background
Recent Developments

- Cap on non-economic damages was ruled unconstitutional by a Circuit Court Judge for Cook County, Illinois in late 2007 in the case of Abigaile Lebron, etc. vs. Gottlieb Memorial Hospital, et.al.
- Illinois Supreme Court ruled February 4, 2010, upholding the Circuit Court's decision

Milliman analysis indicates repeal of medical malpractice caps will increase physician liability claim costs in Illinois by 18%

Unique tort environment in Illinois accentuates cost increase; impact on rates may be blunted

Seattle – Feb. 22, 2010 – Milliman, Inc., a premier global consulting and actuarial firm, today released results from a study of physician professional liability in the State of Illinois. A Feb. 4 decision by the Illinois Supreme Court overturned caps on non-economic damages awarded to claimants. This change in the tort law is likely to have financial implications for insurers in Illinois. Indemnity claim severities will increase by approximately 23% and the average cost that insurers expend defending claims will increase by 10%, relative to what these costs would have been had the cap held. The average overall increase in claim severity will be approximately 18%.

"The magnitude of the estimated increase is largely a reflection of the tort environment in Illinois," said Chad C. Karls, principal and consulting actuary for Milliman, who specializes in medical professional liability coverage. "The overturn of a $500,000 cap on non-economic damages would have less impact in almost any other state. In Illinois, claim severities have been among the highest in the country. In addition, experience in other states suggests that the overturn of a cap like this can result in significant increases in the number of reported claims going forward. This would result in additional increases in costs for insurers." …

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Topic #2: Scope of Analysis

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Scope of Analysis

- Scope of analysis was to evaluate the impact on physicians MPL claim costs of the overturning of the cap on non-economic damages
- Magnitude of impact on rates less clear
  - Reform appears to have been only partially reflected in rates to date
  - Could have seen rate decreases if Reform Act were upheld
- Impact on frequency also unclear
  - Could be significant based on experience of other states

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Topic #3: Overview of Model

Overview of Model
General Approach

- Understand components of Illinois PPL claim costs
  - Loss
  - ALAE
  - CWI vs CWE claims
- Develop distributions around each of these components
  - Including allocation of loss to economic and non-economic damages
- Simulate loss and ALAE costs under two scenarios
  - With cap on damages
  - Without cap on damages

Overview of Model
Illinois Industry Data

§ ISMIE Rate Filing

- Loss severity (per CWI Claim)
- ALAE severity (per CWI Claim and per CWE Claim)
- Portion of claims CWI / CWE / CNP

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Overview of Model
External Industry Data

- States of Florida and Texas closed claim databases
  - Shape of distributions for claim costs by category
    - Economic
    - Non-Economic
  - Correlation of economic/non-economic loss
- State of Texas closed claim database only
  - Allocation of damages between economic/non-economic
  - Portion of claims with loss that is
    - Economic
    - Non-Economic
    - Both
  - Correlation between overall ALAE and loss

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Overview of Model
Simulated Outcome

- For each scenario we estimated the impact on the following components for Illinois physicians
  - Loss Severity
    - Economic
    - Non-Economic
  - ALAE Severity

Topic #4: Derivation of Model Assumptions

Derivation of Model Assumptions
Number of Claims per Occurrence

§ Using industry data, we assumed the following:

- Expected number of claims per occurrence of 1.30
- Distributional form is Zero-Truncated Poisson
- These assumptions imply the following probabilities for the number of claims per occurrence:
  - Probability of 1 claim / occurrence = 74.1%
  - Probability of 2 claims / occurrence = 22.2%
  - Probability of 3 claims / occurrence = 3.3%
  - Probability of 4+ claims / occurrence = 0.3%
  - Weighted average claims / occurrence = 1.30

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Derivation of Model Assumptions
Claim Disposition

- Based on ISMIE Mutual Insurance Company's July 1, 2006 PPL rate filing, we assumed the following claim disposition ratios:
  - CWI to total closed: 17%
  - CWE to total closed: 78%
  - CNP to total closed: 5%
- For CWI claims we then decomposed by category of loss based on the Texas closed claim database

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Derivation of Model Assumptions
Probability of CWI Claims by Category of Loss

Loss Type	Selected Portion of Closed Claims by Loss Type
Economic Only	1.5%
Non-Economic Only	20.5%
Both Types	78.0%
Total Claims	100.0%

Source: Texas Closed Claim Database

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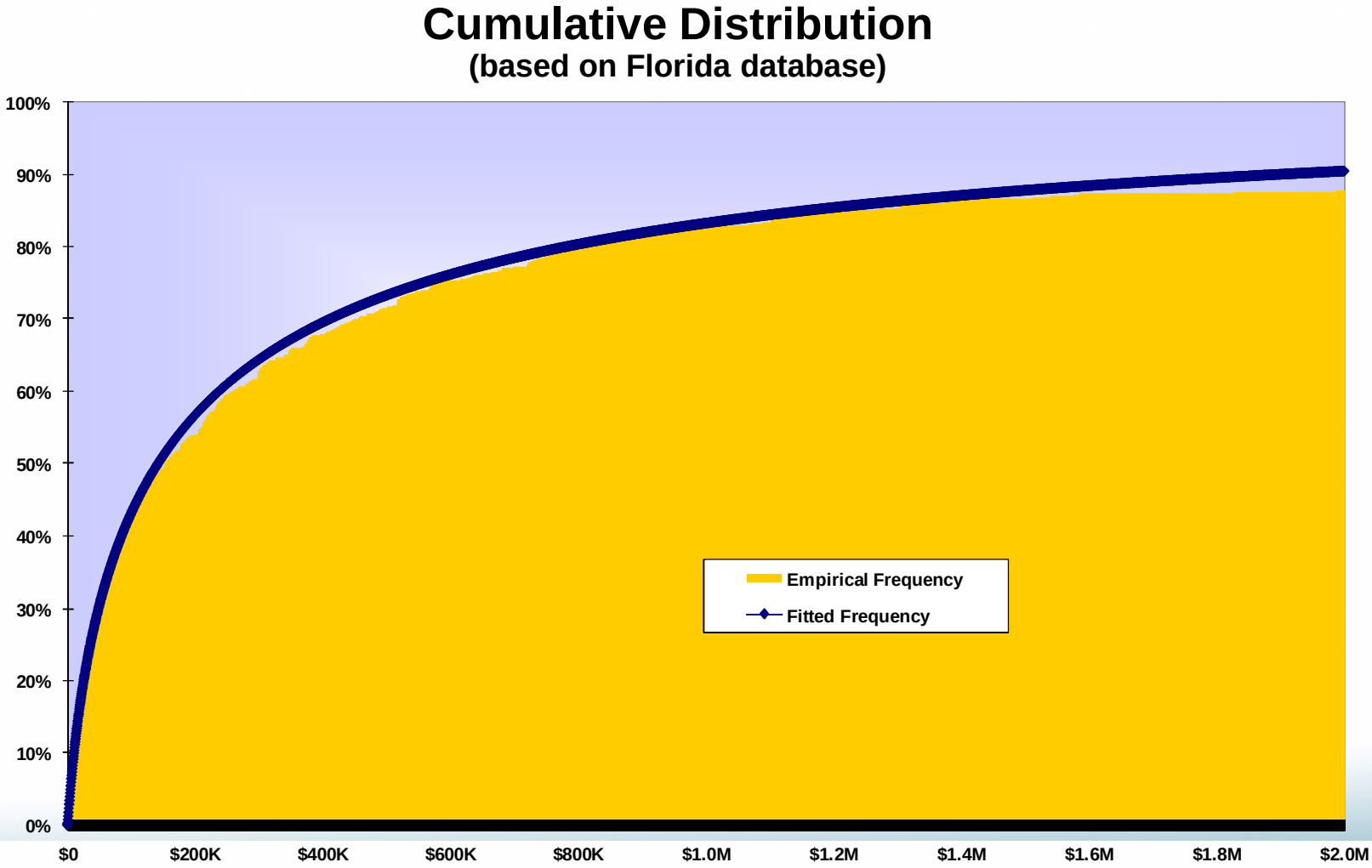
Derivation of Model Assumptions
Claim Severity Distribution by Category of Loss

- Fit a distribution to data for each category of loss
  - Lognormal
  - Exponential
  - Weibull
  - Gamma
  - Pareto
  - Logistic
  - etc.
- Measured correlation between claim severities for each category of loss

Derivation of Model Assumptions
Severity of Claims - Economic



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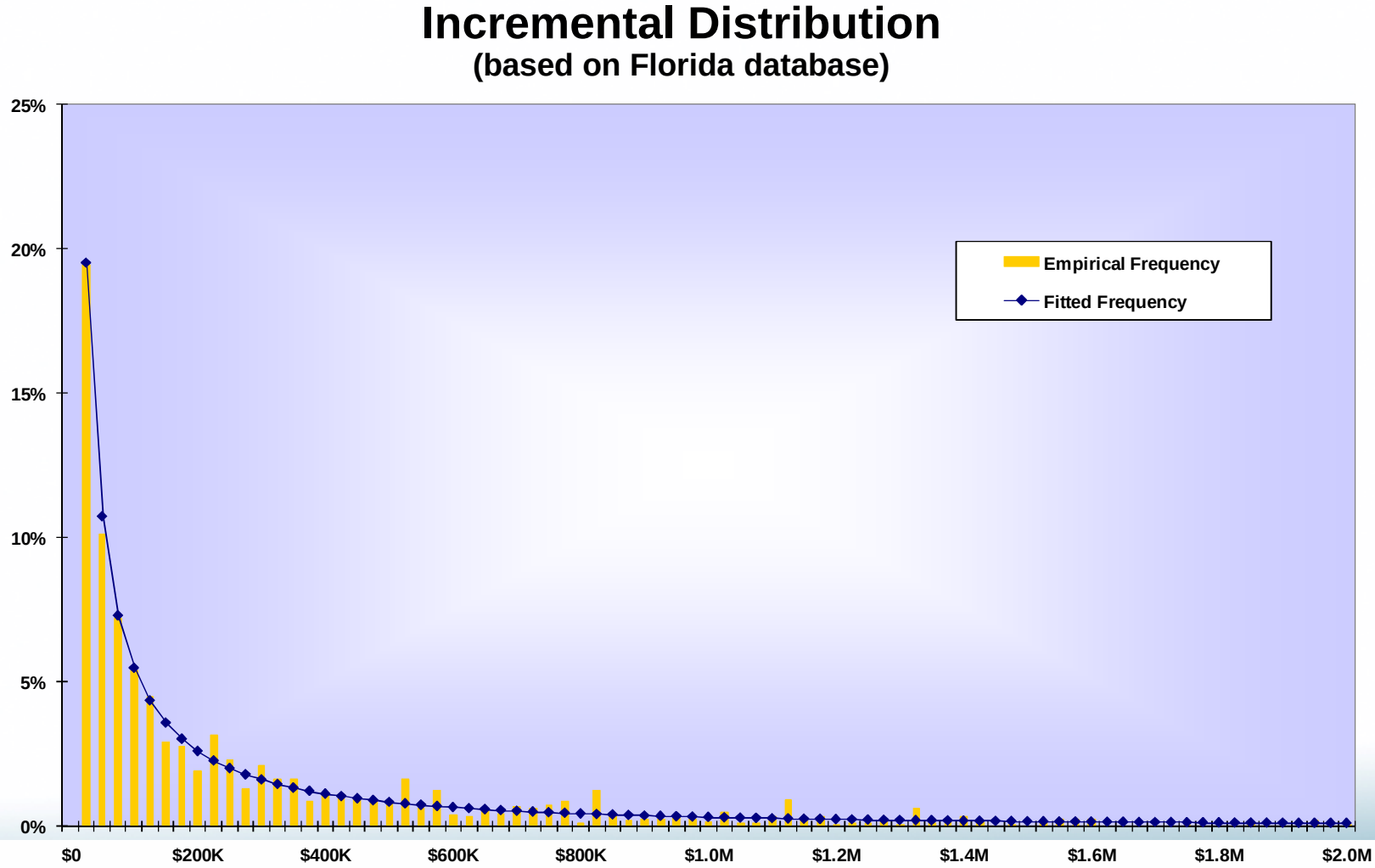
Derivation of Model Assumptions
Severity of Claims - Economic



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Derivation of Model Assumptions
Severity of Claims - Economic

Comparison of Empirical and Fitted Distribution
(based on Florida database)

Threshold	Empirical Cumulative Distribution Of Non-Zero Claims	Exponential Distribution	Lognormal Distribution of Loss Under a Coefficient of Variation of						
			6.75	7.00	7.25	7.50	7.75	8.00	8.25
1,000	0.48%	0.13%	0.57%	0.61%	0.65%	0.69%	0.72%	0.76%	0.80%
2,000	1.17%	0.27%	1.48%	1.56%	1.63%	1.70%	1.77%	1.84%	1.91%
3,000	2.00%	0.40%	2.46%	2.56%	2.66%	2.75%	2.85%	2.94%	3.04%
4,000	2.56%	0.54%	3.43%	3.56%	3.67%	3.79%	3.90%	4.01%	4.13%
5,000	3.07%	0.67%	4.39%	4.53%	4.67%	4.80%	4.93%	5.05%	5.19%
7,500	7.08%	1.01%	6.68%	6.85%	7.01%	7.17%	7.32%	7.47%	7.64%
10,000	8.36%	1.34%	8.80%	8.99%	9.17%	9.34%	9.51%	9.67%	9.85%
12,500	12.26%	1.67%	10.76%	10.96%	11.15%	11.33%	11.50%	11.67%	11.87%
15,000	13.33%	2.01%	12.58%	12.79%	12.98%	13.17%	13.34%	13.51%	13.72%
20,000	16.64%	2.67%	15.88%	16.08%	16.28%	16.46%	16.64%	16.81%	17.03%
25,000	19.44%	3.32%	18.79%	18.99%	19.18%	19.36%	19.53%	19.70%	19.91%
35,000	24.69%	4.62%	23.76%	23.94%	24.11%	24.28%	24.43%	24.58%	24.79%
45,000	28.21%	5.90%	27.90%	28.06%	28.21%	28.35%	28.48%	28.61%	28.80%
55,000	31.25%	7.16%	31.44%	31.57%	31.70%	31.82%	31.93%	32.04%	32.22%
65,000	34.46%	8.41%	34.53%	34.64%	34.74%	34.84%	34.93%	35.02%	35.18%
75,000	36.71%	9.63%	37.26%	37.34%	37.42%	37.50%	37.58%	37.65%	37.79%
100,000	42.06%	12.64%	42.93%	42.96%	43.00%	43.03%	43.06%	43.10%	43.21%
125,000	46.51%	15.54%	47.43%	47.43%	47.42%	47.42%	47.42%	47.42%	47.50%
150,000	49.41%	18.34%	51.14%	51.10%	51.07%	51.04%	51.01%	50.98%	51.03%
175,000	52.14%	21.05%	54.27%	54.20%	54.14%	54.08%	54.03%	53.98%	54.02%
200,000	54.04%	23.67%	56.96%	56.87%	56.79%	56.71%	56.64%	56.57%	56.58%
250,000	59.46%	28.66%	61.38%	61.25%	61.13%	61.02%	60.92%	60.82%	60.80%
350,000	66.02%	37.67%	67.76%	67.58%	67.42%	67.26%	67.11%	66.98%	66.92%
450,000	69.96%	45.55%	72.21%	72.01%	71.82%	71.63%	71.46%	71.30%	71.22%
550,000	73.79%	52.43%	75.54%	75.32%	75.11%	74.91%	74.73%	74.55%	74.45%
650,000	76.21%	58.44%	78.14%	77.91%	77.69%	77.48%	77.29%	77.10%	76.99%
750,000	78.63%	63.69%	80.23%	79.99%	79.77%	79.56%	79.36%	79.17%	79.05%
1,000,000	82.49%	74.10%	84.05%	83.81%	83.59%	83.37%	83.17%	82.97%	82.84%
Chi-Squared Statistic		1,128.8	1.32	1.11	0.95	0.85	0.79	0.77	0.78

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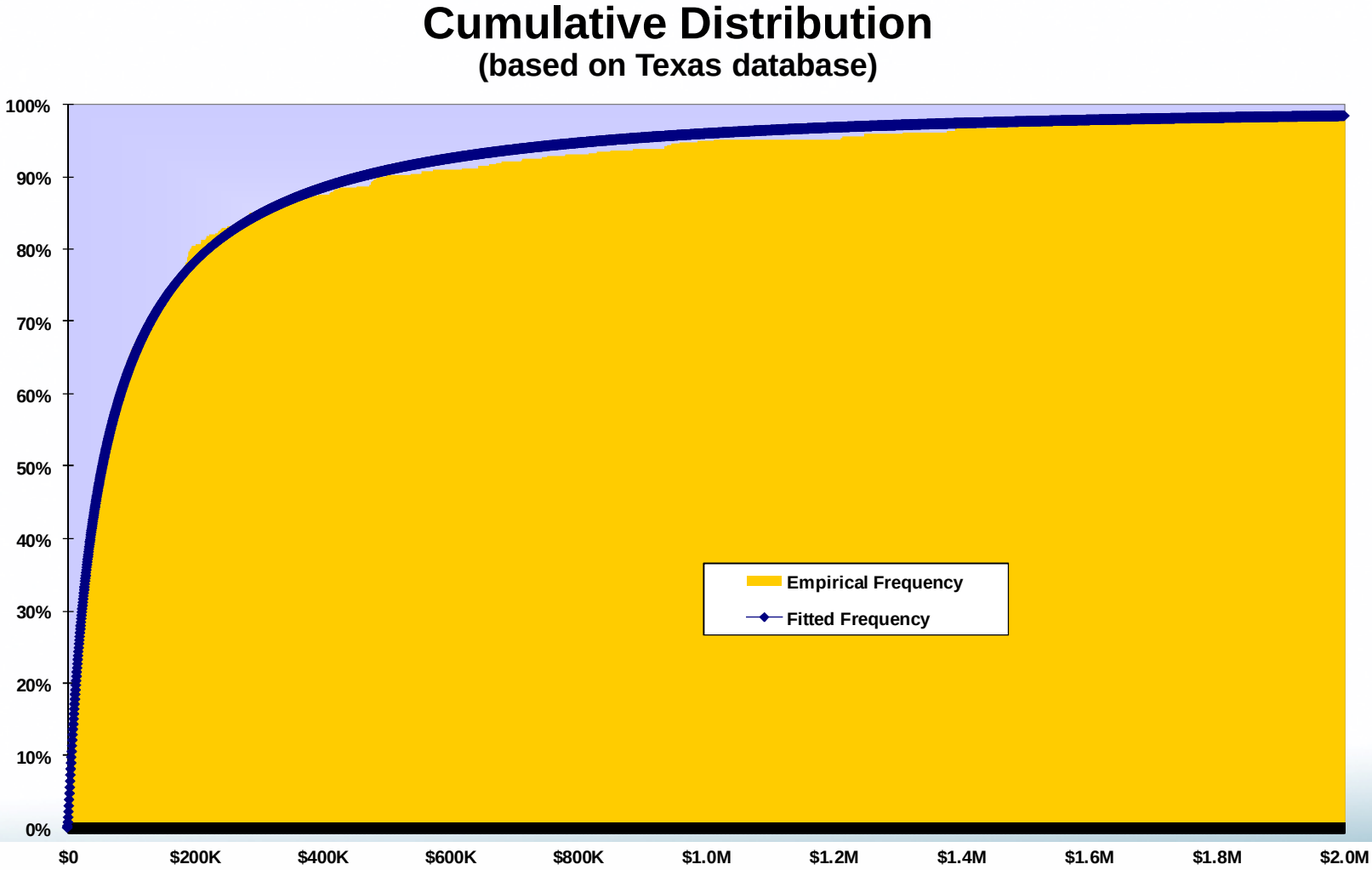
Derivation of Model Assumptions
Severity of Claims - Economic



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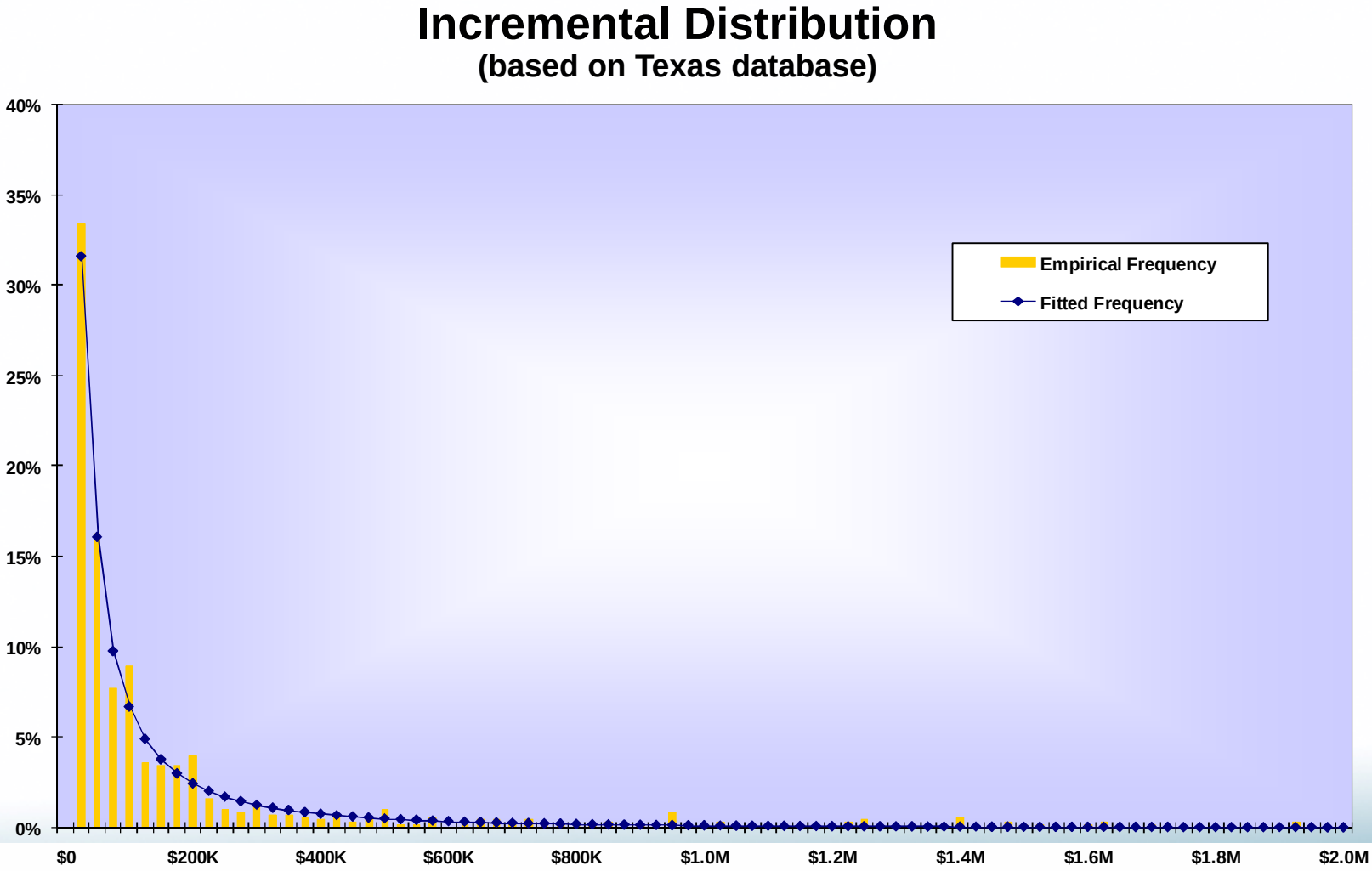
Derivation of Model Assumptions
Severity of Claims - Economic



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Derivation of Model Assumptions
Severity of Claims - Economic

Comparison of Empirical and Fitted Distribution
(based on Texas database)

Threshold	Empirical Cumulative Distribution Of Non-Zero Claims	Exponential Distribution	Lognormal Distribution of Loss Under a Coefficient of Variation of						
			3.00	3.25	3.50	3.75	4.00	4.25	4.50
1,000	0.71%	0.44%	0.40%	0.51%	0.63%	0.75%	0.87%	0.99%	1.12%
2,000	1.99%	0.88%	1.41%	1.68%	1.95%	2.21%	2.47%	2.71%	2.95%
3,000	3.41%	1.32%	2.71%	3.11%	3.50%	3.87%	4.23%	4.56%	4.88%
4,000	4.55%	1.75%	4.13%	4.64%	5.13%	5.58%	6.01%	6.41%	6.78%
5,000	6.68%	2.19%	5.60%	6.20%	6.76%	7.28%	7.76%	8.21%	8.62%
7,500	9.38%	3.26%	9.31%	10.05%	10.72%	11.33%	11.89%	12.40%	12.87%
10,000	14.91%	4.33%	12.87%	13.67%	14.39%	15.04%	15.63%	16.17%	16.65%
12,500	16.76%	5.38%	16.22%	17.04%	17.78%	18.43%	19.02%	19.55%	20.04%
15,000	22.44%	6.42%	19.34%	20.16%	20.88%	21.52%	22.10%	22.62%	23.08%
20,000	27.70%	8.47%	24.96%	25.72%	26.38%	26.97%	27.49%	27.96%	28.38%
25,000	33.38%	10.47%	29.85%	30.52%	31.11%	31.63%	32.08%	32.49%	32.86%
35,000	39.77%	14.34%	37.95%	38.42%	38.84%	39.21%	39.53%	39.82%	40.07%
45,000	45.74%	18.05%	44.38%	44.68%	44.94%	45.17%	45.38%	45.56%	45.71%
55,000	50.85%	21.60%	49.64%	49.78%	49.91%	50.02%	50.12%	50.21%	50.28%
65,000	53.13%	24.99%	54.02%	54.04%	54.05%	54.06%	54.07%	54.08%	54.09%
75,000	57.24%	28.24%	57.74%	57.64%	57.56%	57.49%	57.43%	57.37%	57.32%
100,000	66.19%	35.75%	64.99%	64.68%	64.42%	64.19%	63.99%	63.81%	63.65%
125,000	69.74%	42.48%	70.26%	69.82%	69.44%	69.11%	68.82%	68.56%	68.32%
150,000	73.15%	48.50%	74.28%	73.76%	73.30%	72.90%	72.55%	72.23%	71.94%
175,000	76.56%	53.89%	77.45%	76.86%	76.36%	75.91%	75.51%	75.16%	74.83%
200,000	80.54%	58.72%	80.00%	79.38%	78.84%	78.36%	77.94%	77.55%	77.20%
250,000	83.10%	66.91%	83.86%	83.21%	82.63%	82.12%	81.66%	81.25%	80.87%
350,000	86.65%	78.74%	88.70%	88.05%	87.47%	86.96%	86.49%	86.06%	85.67%
450,000	88.64%	86.34%	91.56%	90.96%	90.41%	89.92%	89.47%	89.06%	88.68%
550,000	90.48%	91.22%	93.43%	92.87%	92.37%	91.91%	91.48%	91.09%	90.73%
650,000	91.62%	94.36%	94.72%	94.21%	93.75%	93.32%	92.93%	92.56%	92.22%
750,000	92.76%	96.38%	95.66%	95.20%	94.77%	94.38%	94.01%	93.66%	93.34%
1,000,000	95.03%	98.80%	97.14%	96.77%	96.42%	96.09%	95.78%	95.49%	95.22%
Chi-Squared Statistic		163.34	0.40	0.26	0.24	0.30	0.43	0.59	0.78

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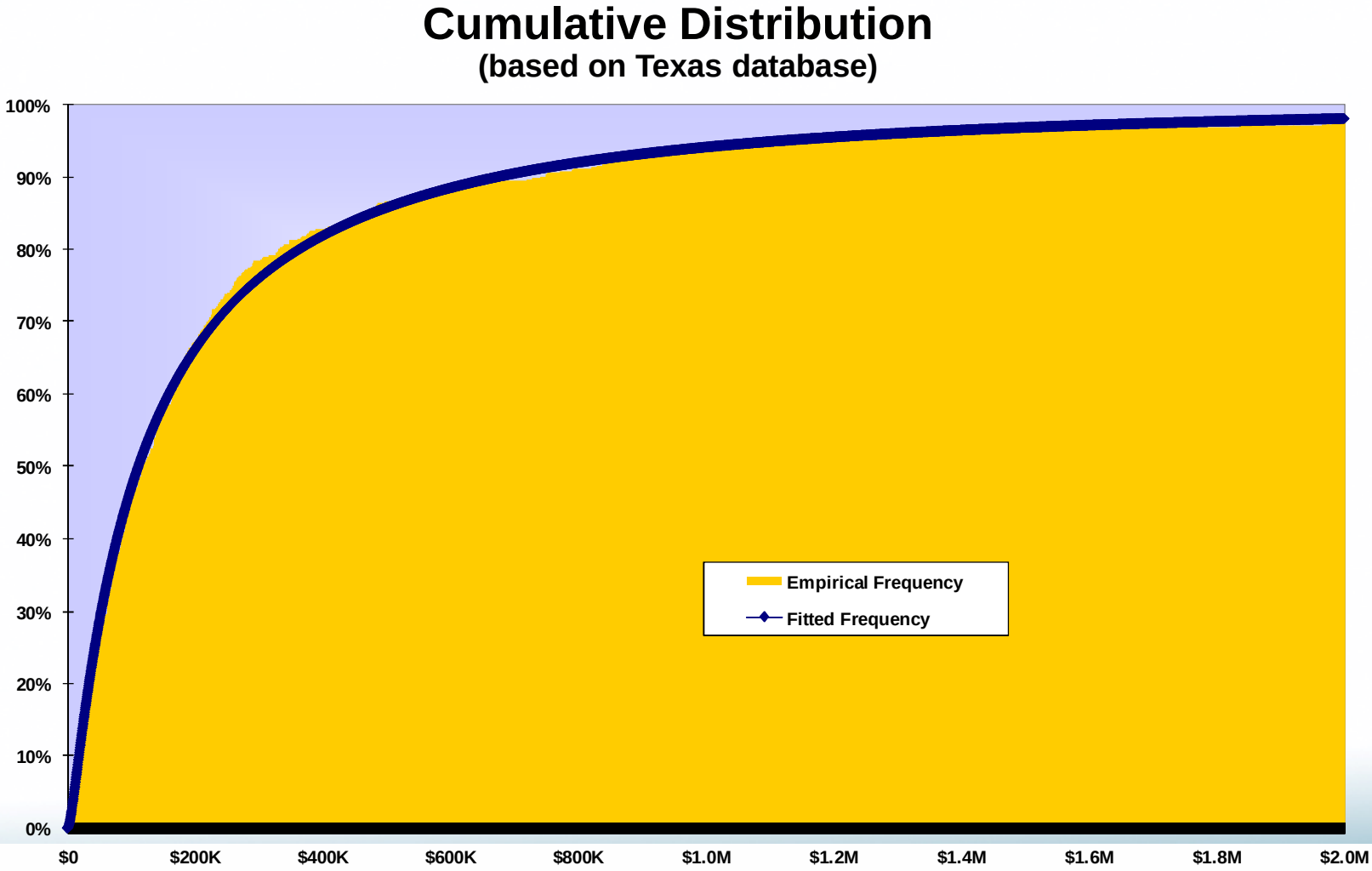
Derivation of Model Assumptions
Severity of Claims – Non-Economic



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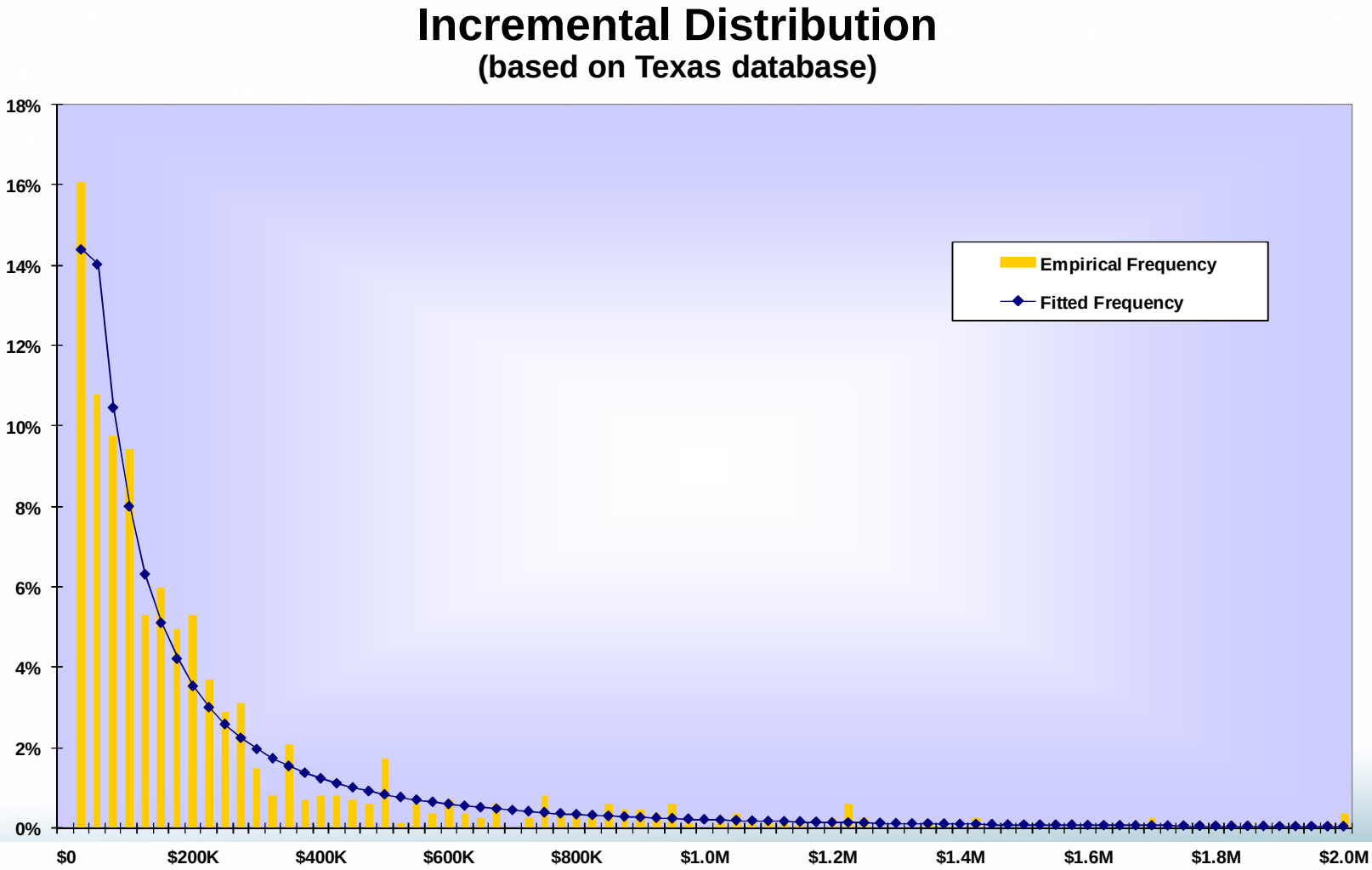
Derivation of Model Assumptions
Severity of Claims – Non-Economic



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Derivation of Model Assumptions
Severity of Claims – Non-Economic

Comparison of Empirical and Fitted Distribution
(based on Texas database)

Threshold	Empirical Cumulative Distribution Of Non-Zero Claims	Exponential Distribution	Lognormal Distribution of Loss Under a Coefficient of Variation of						
			1.50	1.75	2.00	2.25	2.50	2.75	3.00
7,500	1.95%	2.46%	0.67%	1.15%	1.68%	2.22%	2.76%	3.27%	3.75%
10,000	4.35%	3.26%	1.36%	2.11%	2.89%	3.63%	4.33%	4.98%	5.59%
12,500	5.96%	4.06%	2.25%	3.27%	4.25%	5.17%	6.00%	6.76%	7.44%
15,000	8.48%	4.86%	3.32%	4.57%	5.73%	6.77%	7.70%	8.54%	9.29%
20,000	11.68%	6.42%	5.81%	7.42%	8.83%	10.05%	11.11%	12.03%	12.84%
25,000	16.04%	7.96%	8.61%	10.44%	11.99%	13.29%	14.41%	15.36%	16.19%
35,000	20.50%	10.97%	14.56%	16.54%	18.13%	19.44%	20.52%	21.43%	22.21%
45,000	24.63%	13.87%	20.50%	22.35%	23.82%	24.99%	25.96%	26.76%	27.45%
55,000	28.06%	16.69%	26.14%	27.73%	28.98%	29.97%	30.78%	31.45%	32.02%
65,000	31.84%	19.41%	31.38%	32.64%	33.64%	34.43%	35.07%	35.60%	36.05%
75,000	36.54%	22.04%	36.19%	37.11%	37.84%	38.43%	38.91%	39.30%	39.64%
100,000	45.93%	28.25%	46.48%	46.58%	46.70%	46.81%	46.92%	47.01%	47.08%
125,000	51.20%	33.96%	54.66%	54.08%	53.71%	53.44%	53.24%	53.08%	52.95%
150,000	57.16%	39.22%	61.22%	60.12%	59.36%	58.79%	58.35%	57.99%	57.69%
175,000	62.08%	44.06%	66.53%	65.05%	63.99%	63.19%	62.56%	62.05%	61.62%
200,000	67.35%	48.51%	70.89%	69.13%	67.85%	66.87%	66.10%	65.47%	64.94%
250,000	73.88%	56.39%	77.50%	75.43%	73.87%	72.66%	71.69%	70.89%	70.22%
350,000	81.33%	68.71%	85.67%	83.45%	81.72%	80.32%	79.18%	78.22%	77.41%
450,000	84.31%	77.55%	90.27%	88.19%	86.49%	85.09%	83.92%	82.93%	82.07%
550,000	87.29%	83.89%	93.08%	91.21%	89.63%	88.30%	87.16%	86.18%	85.32%
650,000	88.89%	88.44%	94.90%	93.25%	91.81%	90.56%	89.48%	88.54%	87.71%
750,000	90.49%	91.70%	96.14%	94.69%	93.39%	92.23%	91.22%	90.32%	89.52%
1,000,000	93.93%	96.38%	97.89%	96.85%	95.84%	94.90%	94.05%	93.27%	92.57%
Chi-Squared Statistic		50.05	8.73	3.99	1.77	0.83	0.58	0.72	1.08

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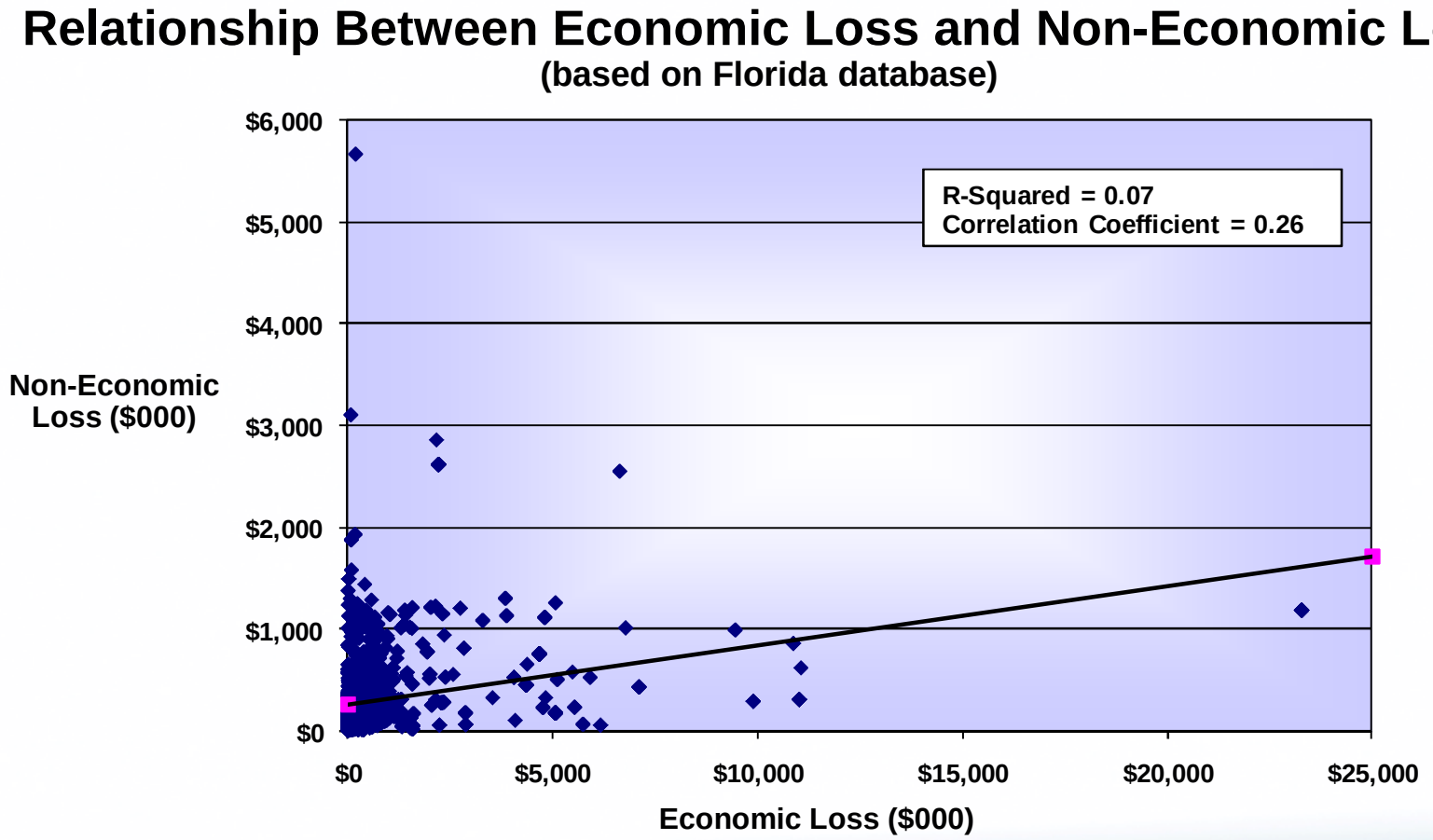
Derivation of Model Assumptions
Severity of Claims – Loss Correlation



Note: Data includes only claims with non-zero values for both economic loss and non-economic loss

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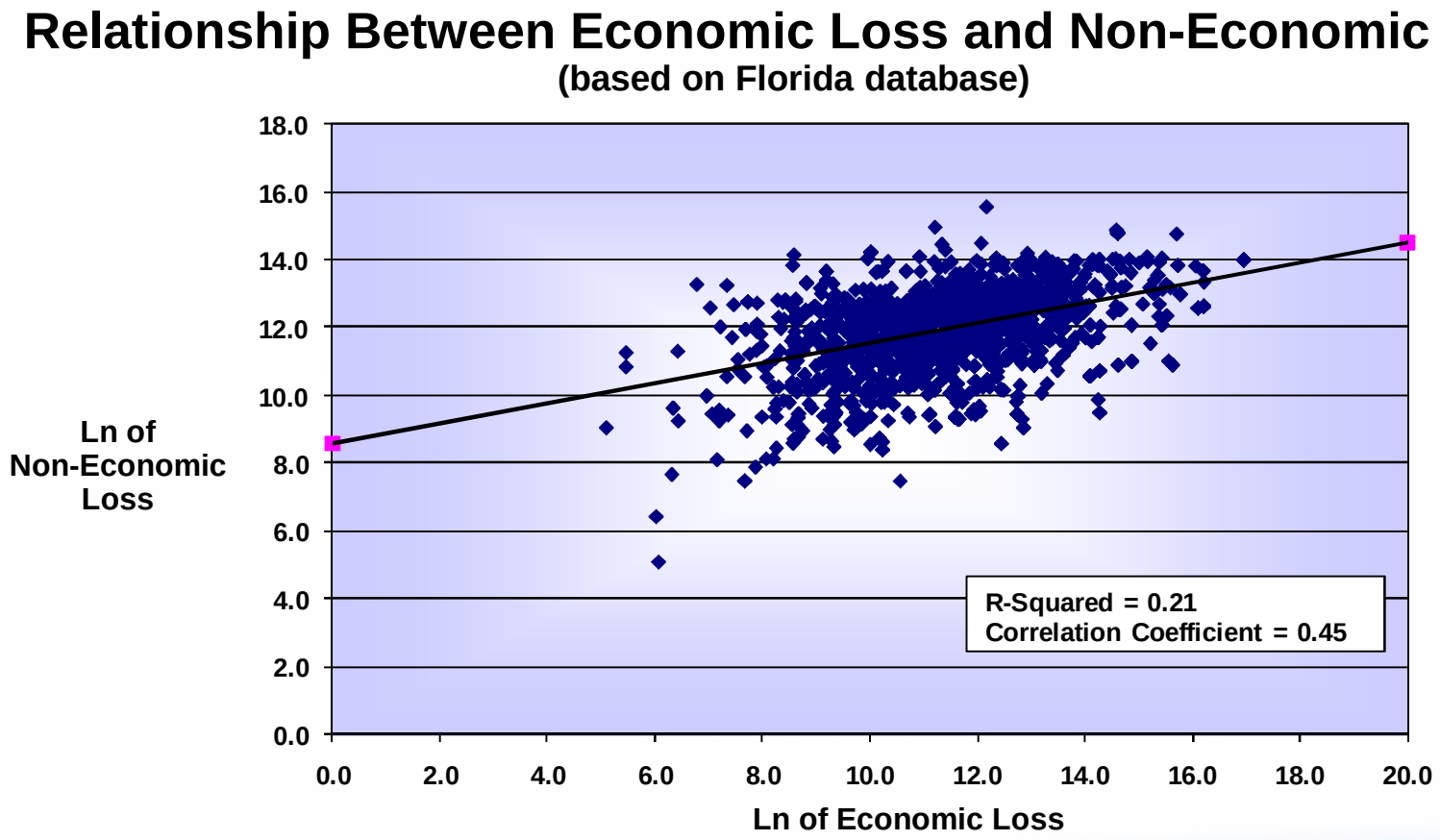
Derivation of Model Assumptions
Severity of Claims – Ln(Loss) Correlation



Note: Data includes only claims with non-zero values for both economic loss and non-economic loss

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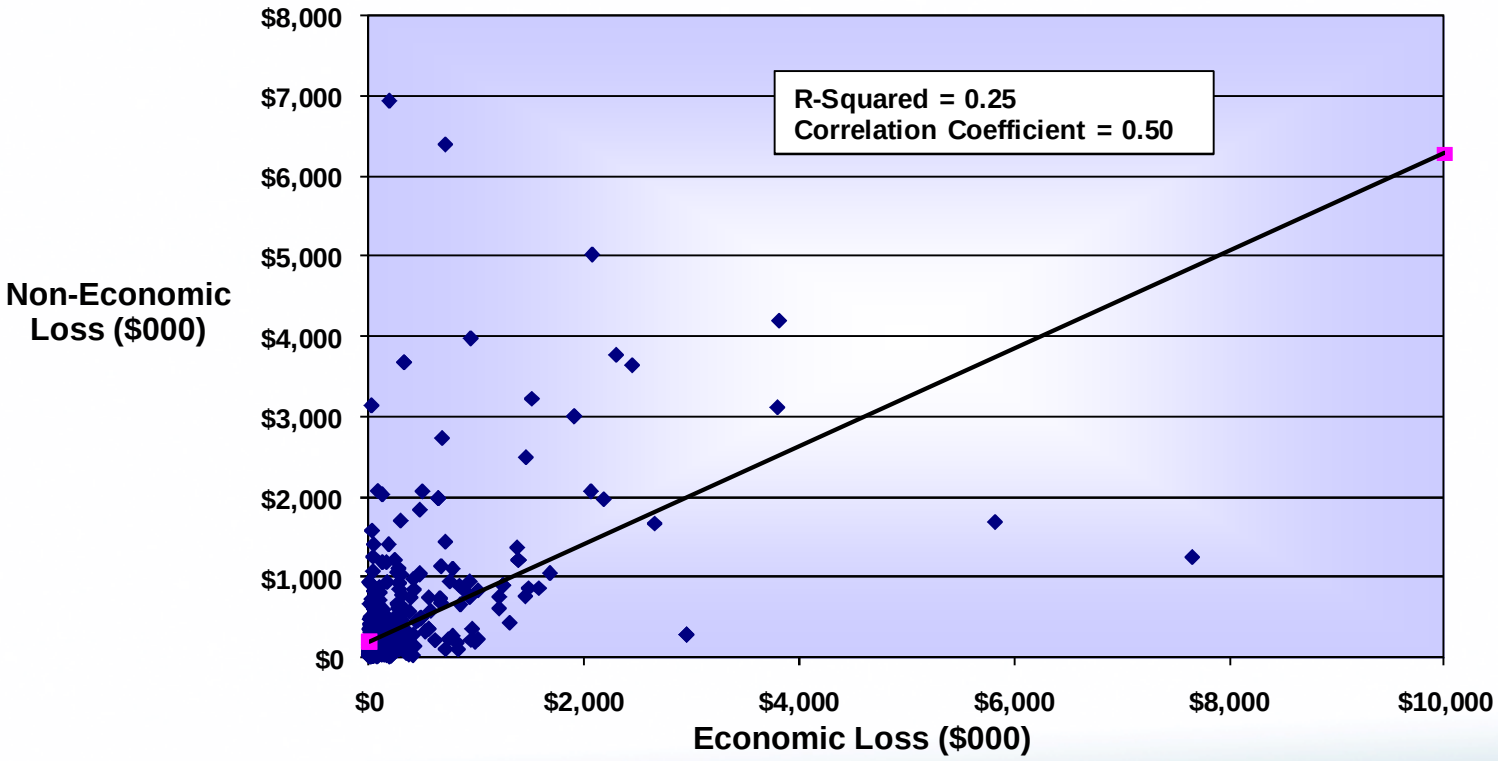
Derivation of Model Assumptions
Severity of Claims – Loss Correlation

Relationship Between Economic Loss and Non-Economic Loss
(based on Texas database)



Note: Data includes only claims with non-zero values for both economic loss and non-economic loss

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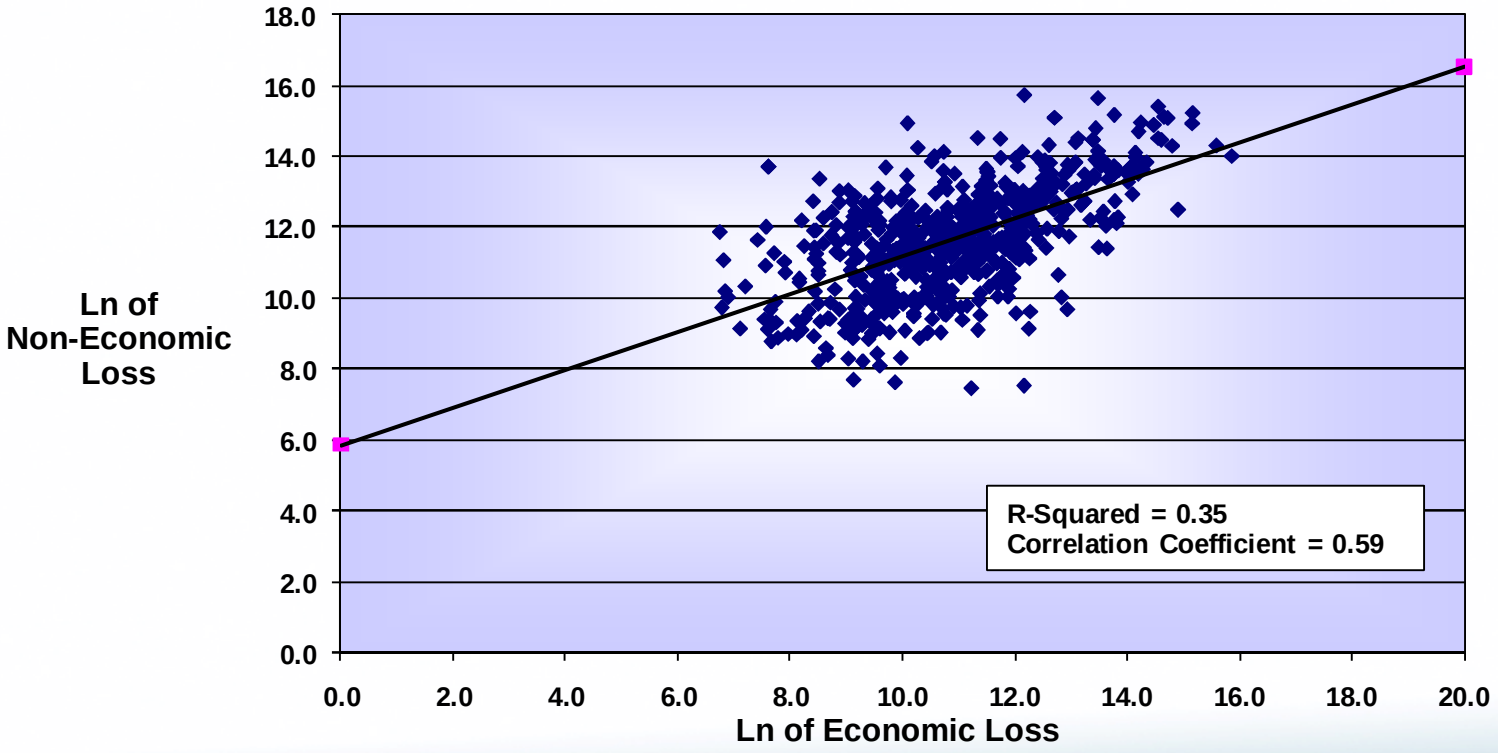
Derivation of Model Assumptions
Severity of Claims – Ln(Loss) Correlation

Relationship Between Economic Loss and Non-Economic Loss
(based on Texas database)



Note: Data includes only claims with non-zero values for both economic loss and non-economic loss

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Derivation of Model Assumptions
Severity of Claims – Loss Correlation

Relationship Between Economic Loss and Non-Economic Loss

Database	Assumption	R Squared	Indicated Correlation Coefficient: Pearson's R	Indicated Correlation Coefficient: Spearman's Rank Order	Selected Relationship / Correlation Coefficient
Florida	Linear Relationship	0.070	0.265	0.455	
	Log-Linear Relationship	0.207	0.455	0.455	Log-Linear
Texas	Linear Relationship	0.247	0.497	0.567	0.500
	Log-Linear Relationship	0.351	0.592	0.567	

Note: Relationship derived from non-zero values of economic and non-economic losses

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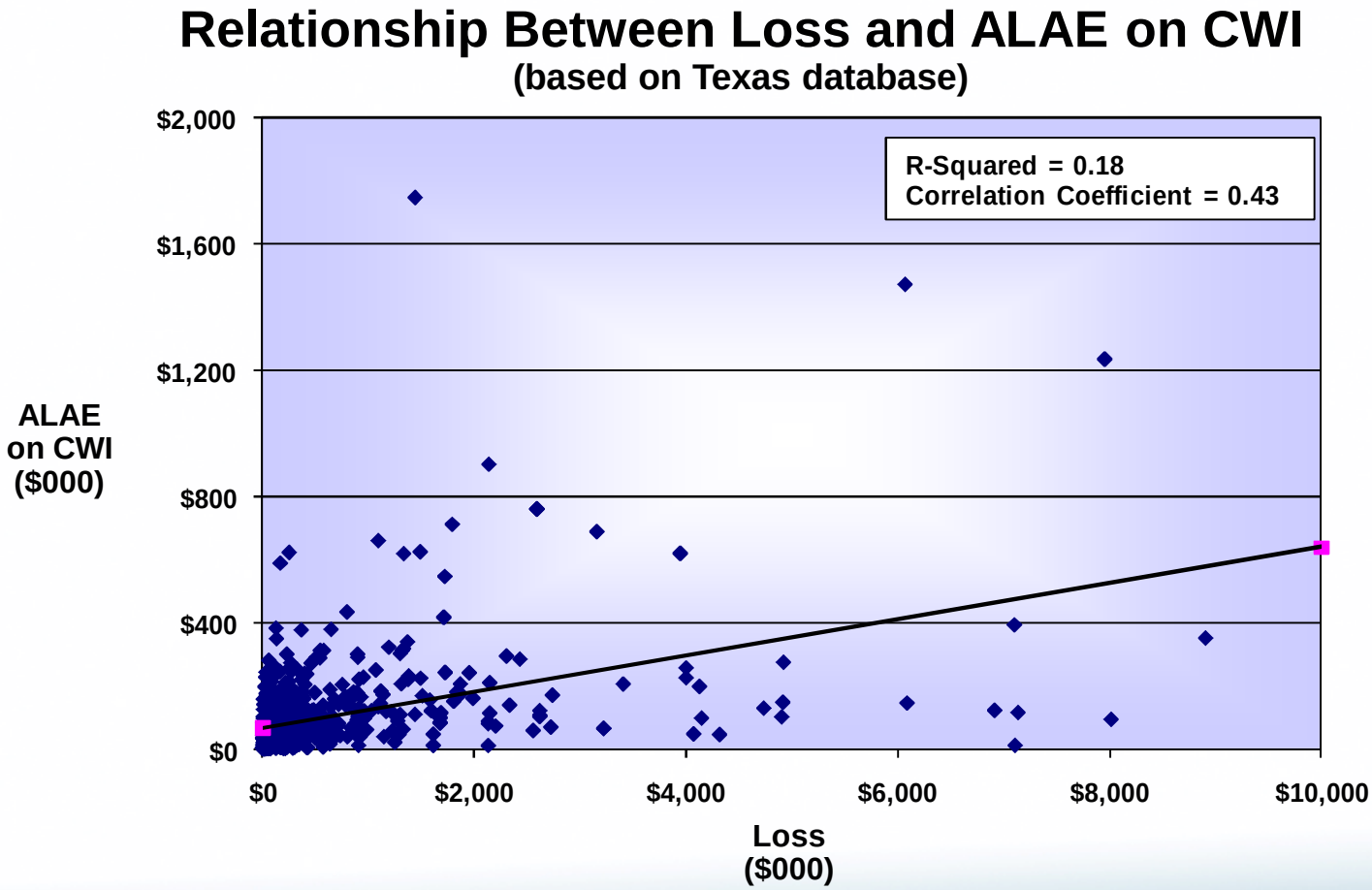
Derivation of Model Assumptions
Severity of Claims – ALAE on CWI

- In modeling ALAE severities we differentiated between CWI and CWE claims
- Based on ISMIE's rate filing and a 4% per annum ALAE trend, we assumed the following:
  - ALAE per CWI claim = $90,890
  - ALAE per CWE claim = $50,656
- ALAE per CWE claim remains fixed throughout the model
- ALAE severity per CWI claim varies with the loss severity in a log-linear fashion with a slope of 0.50

Derivation of Model Assumptions
Severity of Claims – ALAE on CWI Correlation



Note: Data includes only claims with non-zero values for both loss and ALAE on CWI

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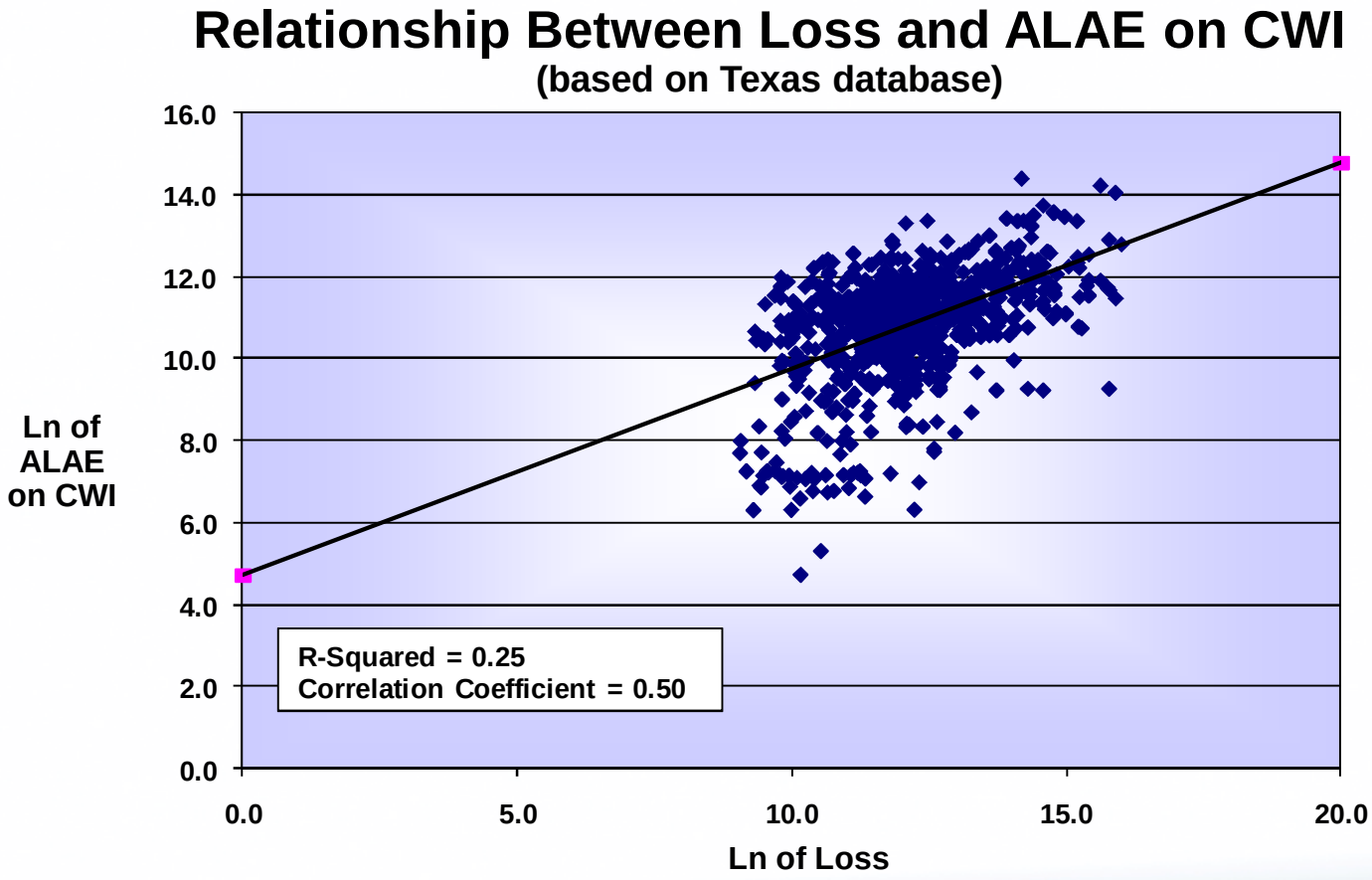
Derivation of Model Assumptions
Severity of Claims – Ln(ALAE on CWI) Correlation



Note: Data includes only claims with non-zero values for both loss and ALAE on CWI

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Topic #5: Summary of Results

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Summary of Results

Indicated Increase in Severity Due to Reform Repeal

(Assuming $1,000,000 Policy Limits)

Estimated Per Occurrence	Cap on Damages With	Cap on Damages Without	Indicated Increase
Mean Indemnity	117,000	144,000	23%
Mean ALAE	67,200	73,600	10%
Mean Indemnity & ALAE	184,200	217,600	18%

Note: Measured increases are per reported claim.

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Observations

- Large estimated impact due to Illinois MPL severities
  - Among highest countrywide
  - Impact on calendar year payments less clear
    - Mix of accident dates within calendar year
    - Delay in settlements
    - Delay in claim filings
- Impact on rates will likely be smaller
  - Few insurers had reduced rates for tort reform
  - May see some rate increases among insurers who had taken rate decreases
  - Had Supreme Court stayed the reforms, we might have seen rate decreases

Topic #6: Other Considerations

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Other Considerations

- Accompanying Oral Discussion
  - This document is not complete without the accompanying oral discussion and explanation of the underlying information and concepts as well as any interpretational limitations.
- Limited Distribution
  - This document should not be distributed, disclosed or otherwise furnished, in whole or in part, without the express written consent of Milliman.
- Data Reliance
  - We have relied upon data and other background information from the Florida Office of Insurance Regulation and the Texas Department of Insurance, as well as rate filings made by ISMIE, without audit or independent verification. We have performed a limited review of the data for reasonableness and consistency and have not found material defects in the data. If there are material defects in the data, it is possible that they would be uncovered by a detailed, systematic review and comparison of the data to search for data values that are questionable or relationships that are materially inconsistent. Such a review was beyond the scope of our assignment.